



Heliophysics Explorers Program (HEP) 2022 Small Explorer (SMEX) and Explorer Mission of Opportunity (MO) Announcements of Opportunity (AOs)

Preproposal Conference: Solicitation Overview

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2022 Heliophysics Explorers: Two Solicitations

2022 Small Explorer Announcement of Opportunity: 2022 SMEX AO = NNH22ZDA016O

Solicits proposals for **science investigations**. These must support the goals and objectives of the Heliophysics Explorer Program, must be implemented by Principal Investigator (PI)-led investigation teams, and must be implemented through the provision of **complete spaceflight missions**.

2022 Explorer Mission of Opportunity AO: 2022 Explorer MO AO = NNH22ZDA017O

Solicits proposals for **MO science investigations**. These must support the goals and objectives of the Heliophysics Explorer Program, must be implemented by Principal Investigator (PI)-led investigation teams, and must be implemented through the provision of **complete spaceflight missions**.

Both are 2-step competitions: KDP-A is the selection of a Step-1 proposal for a Phase A concept study, KDP-B is the down-selection of a mission to enter Phase B following evaluation of Concept Study Reports.

Important Note: These solicitations incorporate many changes relative to the drafts and previous Explorers solicitations, including both policy changes and changes to proposal submission requirements. All proposers must read the solicitations carefully, and all proposals must comply with the requirements, constraints, and guidelines contained within. One objective of the Preproposal Conference today is to familiarize the heliophysics community with some of these changes. However, today's presentations are not intended to provide comprehensive coverage of all requirements, constraints and guidelines.

NASA Heliophysics Science Objective & Goals

- The NASA Strategic Objective (*NASA 2022 Strategic Plan*) that encompasses Heliophysics:
 - “understand the Sun, Earth, solar system, and universe”
- In response to the above strategic objective, the NASA Science Mission Directorate (SMD) conducts heliophysics investigations addressing the following science goals:
 - Explore the physical processes in the space environment from the Sun to the Earth and throughout the solar system;
 - Advance our understanding of the connections that link the Sun, the Earth, planetary space environments, and the outer reaches of our solar system; and
 - Develop the knowledge and capability to detect and predict extreme conditions in space to protect life and society and to safeguard human and robotic explorers beyond Earth
- Resource documents for NASA Heliophysics Science Goals
 - *Science 2020-2024, A Vision of Scientific Excellence* (formerly the 2014 SMD Science Plan)
 - *Our Dynamic Space Environment: Heliophysics Science and Technology Roadmap for 2014-2033*

Selection Factors

- **Section 7.2** Peer evaluation of Step 1 proposal and Step 2 Concept Study Report provides findings on the strengths and weaknesses of an investigation in meeting AO selection criteria
- **Section 7.3** *"The overriding consideration for the selection of proposals submitted in response to this AO will be to maximize scientific value (which includes both science return and risk) while advancing NASA's science goals and objectives within the available [resource] budget for this program."**
- The proposed PI-Managed Mission Cost *will* be considered
 - Proposers are encouraged to propose well below the AO Cost Cap or Adjusted AO Cost Cap
 - Permits greater flexibility and robustness in the Program and in SMD.
- Other programmatic factors
 - planning and policy considerations,
 - available funding for total mission cost,
 - career development opportunities,
 - programmatic merit and risk of any proposed partnerships, and
 - maintaining a programmatic and scientific balance across SMD.

*Specific wording edited
into AO by SMD AA

The Explorers Program AO Process: Step 1 vs Step 2

- The emphasis of the **Step 1** proposal is to convey to the peer community the science achieved by implementation of the proposal provides the most compelling advance in heliophysics that can plausibly be achieved with the assigned resources.
 - NASA recognizes the cost of developing a Step 1 proposal and is continually exploring approaches to enable the merits of an investigation concept to be evaluated with a reduction in proposal detail
 - *E.G.* the reduction in page count and delay of numerous implementation items until Step 2
 - TMC is instructed to “give proposers the benefit of the doubt” in the “proof” of a given technical feasibility.
- The emphasis of the **Step 2** proposal is a thorough demonstration of the feasibility of an investigation initially selected in the Step 1 competition being implemented within the resource constraints of the program.
 - A NASA-funded Phase A study conducts a detailed engineering and program analysis to demonstrate an investigation is feasible within the program resource constraints.
 - **Medium Risk:** “Problems have been identified but are considered within the proposal team’s capabilities to correct within available resources with good management and application of effective engineering resources.” (i.e. the total resource requirements = the resources available)
 - The results of the Phase A study are captured in a Concept Study Report. This report is evaluated with the above stated emphasis on feasibility. TMC is instructed to carefully verify technical and programmatic feasibility.

- **Venture Class Acquisition of Dedicated and Rideshare (VADR)**
 - VADR utilizes new launch vehicle providers, with potentially different processes and requirements from NASA Launch Services Contract
 - VADR provides both advantages and disadvantages for specific investigations.
 - VADR advantage in launch cost is critical for maintaining cadence of SMEX and MO opportunities
 - VADR is designed for missions that can accept increased launch risk than NLS III
 - Within the allowed constraints on launch requirements, most Class D missions are well accommodated by VADR.
- **Dedicated Launch Vehicles**
 - Two classes of performance for SMEX
 - SMEX launch vehicle performance can be augmented, if necessary, by additional PI-managed propulsion option.
- **RideShare:**
 - Only option for some regions of space
 - All proposals are considered for the possibility of RideShare.
 - The feasibility of obtaining a launch is a selection consideration (total mission cost) and can be impacted by:
 - Unusual orbits
 - Very tight constraints on launch window
 - Complex payload accommodation requirements.
- **In most cases, it is essential to discuss your mission with the LSP POC**

SMEX AO

- The AO Cost Cap for a SMEX mission is \$150M in NASA Fiscal Year (FY) 2022 dollars (FY22\$), not including the cost for AO-provided access to space or any contributions.
- The sum of contributions of any kind to the entirety of the investigation is not to exceed one-third (1/3) of the proposed PI-Managed Mission Cost.
- Delivery Readiness Date (AA2S Launch Readiness) NLT Q4 CY2028
- SMEX payloads are Category 3 (per NPR 7120.5F), Class D (per NPR 8705.4A).
- Proposers selected through this AO will be awarded a contract, capped at \$2.0M FY 2022 dollars, to conduct an approximately 9-month Phase A concept study.
- AO-provided access to space per “*Launch Services Program Information Summary*” document
 - Available in the program library: <https://explorers.larc.nasa.gov/HPSMEX22/SMEX/programlibrary.html>
- ISS-attached proposals are allowed and considered AO-provided launch service.
- Proposals featuring PI-provided access to space (aka Alternative Access to Space) are also allowed.

SMEX Proposal Schedule

• AO Release Date	September 7, 2022
• Preproposal Conference	October 6, 2022
• Mandatory Notice of Intent to Propose Deadline	October 24, 2022
• Electronic Proposal Submittal Deadline	December 8, 2022
– 11:59 p.m. Eastern Time	
• Letters of Commitment Due (with Proposal)	December 8, 2022
• Deadline for Augmented Submission via the NASA Box Service	December 12, 2022
• Step-1 Selections Announced (target)	June 2023
• Initiate Phase A Concept Studies (target)	July 2023
• Phase A Concept Study Reports Due (target)	April 2024
• Down-selection of Investigation(s) for Flight (target)	September 2024
• AO-Required Delivery Readiness Date	NLT Q4 CY2028
• AO-Required Launch Readiness Date for PI-provided primary launch services	NLT Q4 CY2028

Explorer MO AO at a Glance

- This Explorers MO AO solicits **two** classes of Complete Spaceflight Missions MOs, differentiated by their respective Cost Caps & access to space.
 - **Standard-class:** AO Cost Cap \$70M in FY2022 dollars,
 - **SmallSat-class:** AO Cost Cap is \$35M in FY2022 dollars
- The sum of contributions of any kind to the entirety of the investigation is not to exceed one-third (1/3) of the proposed PI-Managed Mission Cost.
- Launch Readiness Date NLT Q1 CY2028
- MO payloads are Category 3 (per NPR 7120.5F), Class D (per NPR 8705.4A).
- Proposers selected through this AO will be awarded a contract to conduct an approximately 6-month Phase A concept study.
 - Standard-class MO Phase A contract capped at \$600K FY2022 dollars
 - SmallSat-class MO Phase A contract capped at \$350K FY2022 dollars
- AO-provided access to space per “*Launch Services Program Information Summary*” document available in the program library. PI-provided access to space is permitted. <https://explorers.larc.nasa.gov/HPSMEX22/MO/programlibrary.html>

MO Proposal Schedule

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• Initiate Phase A Concept Studies (target)	July 2023
• Phase A Concept Study Reports Due (target)	January 2024
• Down-selection of Investigation(s) for Flight (target)	June 2024
• AO-Required Delivery Readiness Date	NLT Q1 CY2028
• AO-Required Launch Readiness Date	NLT Q1 CY2028

References

SMEX and MO Reference Material

2022 Heliophysics SMEX and Explorer MO Acquisition Page

The 2022 Heliophysics SMEX and Explorer MO acquisition home page is available at <https://explorers.larc.nasa.gov/HPSMEX22/>

The contents of the web site include the following:

- Links to SMEX and Explorer MO pages
- 2022 Heliophysics SMEX and Explorer MO news
- Preproposal conference
- Community announcements
- SAM.gov
- SMEX and MO Q&As
- Teaming interest

SMEX Reference Material

2022 Heliophysics SMEX Acquisition Home Page

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2022 Heliophysics SMEX Program Library

- The Library provides additional regulations, policies, and background information. The Library is accessible at <https://explorers.larc.nasa.gov/HPSMEX22/SMEX/programlibrary.html>
- It is incumbent upon the proposer to ensure that the documents used in proposal preparation are of the date and/or revision available in the Program Library.
- A detailed Change Log has been implemented, and will continually document updates to the Program Library.

MO Reference Material

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Questions?

All further questions pertaining to the SMEX AO or Explorer MO AO
MUST be addressed by email to:

Dr. Dan Moses
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(subject line to read “SMEX AO or Explorer MO AO as applicable”)

